USE OF STATIC ELECTRICITY FOR FILM HOLD DOWN

STUDY

220

Date: 4 March 1964

PROJECT AUTHORIZATION REQUEST

PAR 220

4 Mar 64

TITLE: Use of Static Electricity for Film Hold Down

TASK/PROBLEM

Investigate possible means to hold film flat or in a given plane through the use of static electricity. Intended use is to hold films flat in rear projection and direct viewers without a covering glass or the complexities of a vacuum system.

PROPOSAL

It is proposed that authorization be granted for the design and fabrication of breadboard equipments to be used in the investigation of:

1. Sensitivity of exposed film to static electrical charges.
2. Study of the dust attraction problem.
3. To study suspension of film in a plane with or without contact to a hard surface for:
   a. Static conditions
   b. Dynamic conditions

Complete investigation will require design and fabrication of two breadboard pieces of equipment.

Direct Film Viewer - The first breadboard will be basically a film viewer with a light source, glass platen (that may be removed) and a mounted microscope for studying film to glass contact and film flatness. An electrically driven film transport will be provided and used to study methods of applying and removing electrical charges as required. A vacuum assist will be incorporated only to the amount necessary to aid the electrostatic force to hold the film flat.

Rear Projection Viewer Breadboard - The breadboard equipment outlined above will be modified to the degree necessary to simulate rear projection viewers with high intensity light sources. Investigations and study with this breadboard will cover requirements outlined above while attempting to hold the film plane in different attitudes, ie., vertical and horizontally.

Investigation will cover various methods of applying and removing the electrical charge for all types of photographic film. The intensity of the field around the film as related to the hold-down force, and a tendency to collect dirt (dust) will also be studied and reported. Conducting and non-conductive glass platens will be investigated along with the determination of the feasibility of attempting to hold film flat by electrostatic means in an air space.

Investigation will be limited to processed film only.

PROGRAM OBJECTIVE

The objective of this study will be a final report discussing in detail all approaches studied during the course of this investigation. The report will also contain recommendations for

1. Desireability of additional study in this area, or
2. Feasibility of employing static electricity for film hold down.
3. Recommended design specifications for:
   a. Direct film viewers
   b. Rear projection film viewers.